



# ROBOTICS UPDATE

"Providing network-integrated robotic solutions for C4ISR applications."

[www.spawar.navy.mil/robots/](http://www.spawar.navy.mil/robots/)

Spring 2005 / Vol. 5, No. 1

## Brigadier General Reeves Visits SSC SD



**Bart Everett (r), SSC San Diego, describes to BG Reeves (I) the SSC SD-developed marsupial cage mounted on the MDARS Exterior robot as an URBOT is recovered for transport.**

**B**rigadier General Stephen Reeves (US Army), Joint Program Executive Officer for Chemical and Biological Defense (PEO-CBD), visited the Robotics Group at SSC San Diego on 24 February 2005. The purpose of BG Reeves' visit was to become familiar with SSC San Diego's ongoing programs and technical capabilities, primarily in the area of robotics. He was accompanied by COL Camille Nichols (US Army), Program Manager for Guardian (PM-Guardian), who had previously visited the Center last fall (see *Robotics Update*, Vol. 4, No. 3).

Following a command-overview briefing by the Center's Commanding Officer, Captain Timothy Flynn, BG Reeves and COL Nichols were given technical status updates on two key Army

programs the Robotics Group is supporting for the Product Manager, Force Protection Systems (PM-FPS): the Mobile Detection Assessment Response System (MDARS) and the Family of Integrated Rapid Response Equipment (FIRRE). Mr. Jon Moneyhun, FIRRE Lead Project Officer, presented a program update on the FIRRE effort. Robin Laird, FIRRE Technical Director, presented a brief summary of un-



**Robin Laird (c), FIRRE Technical Director, describes unattended sensors to BG Reeves (r).**

(continued on page 2, column 1)

## Navy SEALs See Stabilization Technology

**O**n 11 May, Rear Admiral Kenneth Slaght, Commander, SPAWAR, hosted a visit to the Robotics Group for SPECWARCOM Deputy Commander Captain John McTighe and his Science Advisor, John Young. The purpose of this visit was to view the innovative stabilization technology of Motion Picture Marine of Marina del Rey, CA ([www.motionpicturemarine.com](http://www.motionpicturemarine.com)).

In 2003, SSC San

stabilization in yaw, with the added advantage of being remotely controlled as a pan/tilt unit. Such a three-axis configuration has been used on the Motion Picture Marine Buoy-Cam for filming the America's Cup sailing races



**Left to right, SPECWARCOM Science Advisor John Young, Bart Everett, Deputy Commander CAPT John McTighe, and Dave Grober (Motion Picture Marine) discuss Perfect Horizon stabilization technology.**



**Dave Grober (c) discusses possible stabilization applications with RADM Kenneth Slaght (r) (COMSPAWAR) and USV Project Manager, Mike Bruch (l).**

Diego acquired a *Perfect Horizon Stabilization System* made by Motion Picture Marine for incorporation on the Joint Robotics Program (JRP) Unmanned Surface Vehicle (USV) project. The two-axis gimbal configuration has been in use since that time stabilizing camera and sensor systems aboard the USV in both pitch and roll. An optional third axis can be added to provide

from the perspective of the course-marker buoy.

The *Perfect Horizon* was originally developed for stabilizing motion-picture cameras on moving platforms such as boats and ground vehicles. It was employed in filming the surfing sequences in *Die Another Day* and *Blue Crush*, and in *Harry Potter* and *The Prisoner of Azkaban*. The *Perfect Horizon* was awarded an Emmy and recently nominated for an Oscar for its patented stabilization technology.

The Navy SEALs are interested in active stabilization of camera sensor systems and potentially also weapons, while SPAWAR has a wide range of possible applications in ISR and homeland defense. SSC

(continued on page 2, column 2)

## General Reeves Visit (continued)

manned systems efforts within the Robotics Group, followed by an overview of SSC San Diego's role under FIRRE.

The Robotics Group then conducted a Force-on-Force demonstration in the Robotic Operations Command Center (ROCC). MDARS exterior robots performed autonomous security missions for a Blue Force using the Multiple Resource Host Architecture (MRHA) to simultaneously control heterogeneous unmanned systems. Attacking Red Force robots, teleoperated assets from the Robotic Systems Pool, were detected by perimeter sensors, which in turn cued the MDARS defensive robots to respond accordingly. Afterwards, BG Reeves and COL Nichols were given a tour of the Robotics Facility complex, with static displays of various ongoing projects.



**Bart Everett (r) points out the various robots in the Joint Robotics Program Robotic Systems Pool to BG Reeves (l) and discusses the benefits to the joint warfighter.**

BG Reeves saw a demonstration of an automated refueling system for vertical-takeoff-and-landing UAVs being developed as part of the Joint Robotics Program

(JRP) Autonomous UAV Mission System (AUMS) project. This refueling module completes the second phase of the AUMS project. Phase one addressed automated take-off. Work is still being done on precision landing as well as compliance with the Joint Architecture for Unmanned Systems.



**BG Reeves (r) inspects AUMS automated refueling system as described by Bart Everett (l).**

AUMS represents the Navy's contribution to the JRP's Collaborative Engagement Experiment, and will participate in a Joint demonstration in February of 2006. ♦

## SEALS (continued)

San Diego is working with Motion Picture Marine to investigate various military requirements for stabilization, and pursue a common modular solution that can meet as many of those requirements as possible. ♦



**Bart Everett (c) describes stabilization applications to RADM Kenneth Slaght (r) (COMSPAWARE) and CAPT John Barron (l) (SSC San Diego).**

## 11 Papers Presented at SPIE Conference



**SPIE Defense and Security Symposium Authors**  
**Top Row (L-R):** Greg Kogut, Nathan Farrington, Bart Everett, LCDR Ken Ebert, Ben Stratton, Brandon Sights.  
**Bottom Row (L-R):** Estrellina Pacis, Jason Lum, John Ebken, Rory Hallman, Mitch Barnes, Hoa Nguyen, Kathy Mullens.  
**Not Pictured:** Mike Blackburn, Mike Bruch, Daniel Carroll, Donny Ciccimaro, Tracy Heath-Pastore, Robin Laird, LCDR Craig Ozaki, Nghia Tran, See Yee.

Engineers from SPAWAR Systems Center San Diego presented 11 papers at the International Society for Optical Engineering (SPIE) Defense and Security Symposium in Orlando, Florida on March 31st, 2005. The majority of papers were presented in an SSC San Diego session as part of the Unmanned Ground Vehicle Technology VII conference.

The session had over 100 attendees and there was strong interest in all of the papers presented, which are listed below. These papers can be downloaded from the Robotics website at: [www.spawar.navy.mil/robots/pubs/Pubsidx.html](http://www.spawar.navy.mil/robots/pubs/Pubsidx.html). ♦

*Intelligent Control of a Highly Flexible Robotic Structure With Hundreds of Motor Elements*

*Mobile Robotics Knowledge Base*

*Supporting the Joint Warfighter By Development, Training and Fielding of Man-Portable UGVs*

*Target Detection, Acquisition, and Prosecution from an Unmanned Ground Vehicle*

*ThrowBot: Design Considerations for a Man-Portable Throwable Robot*

*Transitioning Unmanned Ground Vehicle Research Technologies*

*Advances in Autonomy for Small UGVs*

*Applying Unmanned Ground Vehicle Technologies to Unmanned Surface Vehicles*

*Center of Excellence for Small Robots*

*Development and Testing for Physical Security Robots*

*Enabling Technologies for Unmanned Protection Systems*

### ROBOTICS UPDATE is published quarterly by:

**SPAWAR Systems Center  
San Diego, Code 2371  
Unmanned Systems Branch**

Kathy Mullens, Editor  
[robotics@spawar.navy.mil](mailto:robotics@spawar.navy.mil)

Released by:  
H.R. (Bart) Everett  
Technical Director for Robotics